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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/866,434	05/29/2001	Zhineng Fan	HCD-107	5987

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EXAMINER	
NORRIS, JEREMY C	
ART UNIT	PAPER NUMBER
2827	

DATE MAILED: 07/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/866,434	FAN ET AL.	
	Examiner	Art Unit	
	Jeremy C. Norris	2827	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 December 2002* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9 and 11-17* is/are rejected.

7)☒ Claim(s) *10* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 December 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

Applicant's election of Group I, claims 1-17 in Paper No. 1202 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3, 7, and 11-17 are rejected under 35 U.S.C. 102(e) as being anticipated by US 6,428,328, granted to Haba et al. (hereafter Haba).

Haba discloses, referring to figure 25G, a low cost, high reliability interposer for use in electronic packages, comprising:

a) at least one dielectric layer (22) having one major surface and at least one edge;

b) a plurality of conductive pads (the bottoms of vias 34), each having a first and second surface, spaced apart on said major surface of said at least one dielectric layer, said first surface of said conductive pads being plated with at least one layer of metal (24),

and at least a portion of said second surface of said conductive pads being readily adaptable for connection to a conductive member;

c) a plurality of openings disposed in the interposer, said openings having a non-uniform cross section, each opening corresponding to and aligned with one of said conductive pads; and

d) a plurality of reformable conductive members (56, see figure 25), each one located within one of said openings of said interposer and in electrical contact with said portion of said second surface of said conductive pads [claim 1], wherein said at least one dielectric layer comprises an insulative material [claim 2], wherein said insulative material is polyimide (see col. 7, lines 40-45) [claim 3], wherein said conductive pads comprise copper (see col. 8, lines 15-20) [claim 7], wherein said plurality of openings comprises a tapered cross section [claim 11], wherein said conductive members comprise solder [claims 12, 13, 14], further comprising alignment means (36) to align said carrier to a structure adapted to mate therewith (see col. 7, lines 40-60) [claim 15], wherein said interposer may be attached to a structure adapted to mate therewith by a reflow process [claims 16, 17].

Regarding specifically claim 17, since the limitation "wherein said reflow process of said interposer to said structure is performed under uniform pressure" is a process limitation in a product claim, it is well settled that the presence of process limitations in product claims, which product does not otherwise distinguish over the prior art, cannot impart patentability to that product. (*In re Thorpe,* 227 USPQ 964, 1966)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Haba in view of US 6,219,253, granted to Green (hereafter Green).

Haba discloses the claimed invention as described above with respect to claim 2, except Haba does not specifically state that the insulative material is a liquid crystal polymer. However, it is well known in the art that liquid crystal polymer and polyimide are interchangeable dielectric materials as evidenced by Green (see col. 5. line 60 - col. 6, line 5). Therefore, it would have been obvious, to one having ordinary skill in the art, at the time of invention, to use a liquid crystal polymer for the insulative material in the invention of Haba as is known in the art and evidenced by Green. The motivation for doing so would have been to use a widely available known dielectric. Moreover, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Haba in view of US 5,984,691, granted to Brodsky et al (hereafter Brodsky).

Haba discloses the claimed invention as described above with respect to claim 2, except Haba does not specifically state that the insulative material is a epoxy-glass-based. However, it is well known in the art that epoxy-glass and polyimide are interchangeable dielectric materials as evidenced by Brodsky (see col. 6. lines 25-40). Therefore, it would have been obvious, to one having ordinary skill in the art, at the time of invention, to use epoxy-glass for the insulative material in the invention of Haba as is known in the art and evidenced by Brodsky. The motivation for doing so would have been to use a widely available known dielectric. Moreover, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its

suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Haba in view of US 6,332,782, granted to Bezama et al. (hereafter Bezama).

Haba, discloses the claimed invention as described above with respect to claim 2 except Haba does not specifically state that the insulative material has a coefficient of thermal expansion (CTE) that substantially matches the CTE of the material to which it is to be attached. However, Bezama teaches that it is advantageous to match the CTE of the interposer material with the materials of the parts it is joined to (see col. 2, lines 15-40). Therefore, it would have been obvious, to one having ordinary skill in the art, at the time of invention, to match the CTEs of the materials in the invention of Haba as taught by Bezama. The motivation for doing so would have been to favorably alter the stress and/or strain distributions between the joined parts.

Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haba in view of US 4,553,192, granted to Babuka et al (hereafter Babuka).

Haba discloses the claimed invention as described above with respect to claim 1, except Desai does not specifically state that the first surface of said conductive pads being plated with at least one layer of metal is plated with nickel [claim 8], wherein said first surface of said conductive pads being plated with at least one layer of metal is also plated with gold [claim 9], although Examiner does note that Haba discloses over plating the copper layer with a layer of gold. Moreover, Babuka teaches plating gold and nickel over a contact pad (see col. 3, lines 15-25). Therefore, it would have been obvious, to

one having ordinary skill in the art, at the time of invention, to coat the conductive pads of the invention of Haba, with gold and nickel as taught by Babuka. The motivation for adding the nickel layer would have been to prevent migration of the copper into the gold layer and to add durability to the leads.

Response to Arguments

Applicant's arguments with respect to claims 1-9 and 11-17 have been considered but are moot in view of the new ground(s) of rejection.

Allowable Subject Matter

Claim 10 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: Claim 10 states the limitation "wherein said plurality of openings comprises a stepped cross section". This limitation, in conjunction with the other claimed limitations was neither found to be disclosed in, nor suggested by the prior art.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeremy C. Norris whose telephone number is 703-306-5737. The examiner can normally be reached on Mon.-Th., 9AM - 6:30 PM and alt. Fri. 9AM-5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Talbott can be reached on 703-305-9883. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-0725 for regular communications and 703-308-0725 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

DAVID L. TALBOTT
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

JCSN
July 13, 2003